

PINNING, FLOW AND PLASTIC DEFORMATION OF FLUX VORTICES
IN HIGH T_c SUPERCONDUCTORS

A. Roytburd
National Institute of Standards and Technology
Gaithersburg, Maryland

ABSTRACT

In HTSC-materials the vortexes are highly mobile and flexible. This has been reflected in different models of melt of a vortex lattice. I would like to stress another aspect of the problem: an easy nucleation and high mobility of dislocations in the vortex lattice. I consider some models of plastic deformation of vortex lattice as a result of its interaction with a real crystal structure. Depinning is interpreted as yield of plastic flow in vortex medium. Effect of macroscopic defects in crystal structures (pores, inclusions, grain and domain boundaries) is being considered in detail. Available experimental facts on magnetization and a critical current in HTSC and conventional superconductors are discussed from the points of view of depinning to vortexes vs. plastic flow of vortexes vs. plastic flow of vortexes medium.